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Tendencies in Change of the Population Size and Structure of Krasnoyarsk Agglomeration

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The article presents the results of the analysis of the demographic situation in the Krasnoyarsk agglomeration on the background of the Krasnoyarsk Territory and the Russian Federation. The authors determine the features of the changes in number and structure of the population of the Krasnoyarsk agglomeration and the key factors. Moreover, the given work pays special attention to the irregularity of the resettlement of the population.

Keywords: demographic situation, density of population, birth and death rates, migration and demographic problems.

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Demographic situation in Krasnoyarsk Territory

In recent years some positive tendencies in the growth of Russian Federation population were outlined: fertility growth and a decrease in mortality and natality take place in many territories. Meanwhile, reproductive characteristics of Krasnoyarsk Territory population are above the average: in 2010 the birth rate increased by 1 ‰ while the death rate decreased by 0.8 ‰. In 2009 and 2010 natality was growing positively while the rest of the country was experiencing natural loss of 1.7 ‰ in population size.

However, demographic condition is still one of the most acute problems in social-economic development of the territory. Krasnoyarsk Territory is influencing the country's demographic tendencies on a large scale as it occupies almost one seventh of the whole territory of Russian Federation and even more appears as the biggest region of Siberian Federal district.

The population size of Krasnoyarsk Territory ranks as the first within Siberian and Far East territories. By the 1st January 2010 there were 2,838.4 thousand people living in Krasnoyarsk Territory (14.7 % of the Siberian Federal district

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Table 1. Area and population of the Russian Federation, Siberian Federal District, Krasnoyarsk Territory and Krasnoyarsk agglomeration in 2010

| Indicator | Russian Federation | Siberian Federal district | Krasnoyarsk Territory | Krasnoyarsk Agglomeration |
|--------------------------------------|--------------------|---------------------------|-----------------------|---------------------------|
| Area (square km) | 17,098,242 | 5,145,300 | 2,366,797 | 24,148.4 |
| Average resident population (people) | 142,626,386 | 19,327,227 | 2,800,098 | 1,160,663 |
| Birth rate (‰) | 12.5 | 13.9 | 15.1 | 13.5 |
| Death rate (‰) | 14.2 | 13.9 | 17 | 11.6 |
| Percentage of urban population (%) | 73.08 | 70.86 | 76.3 | 91.9 |

inhabitants and 2 % of the population of Russian Federation). The entire area of Krasnoyarsk territory estimates 2,366.8 thousand square kilometers which ranks 2nd biggest territory in Russia and stands for 46 % of Siberian Federal district territory and 13.8 % of whole Russian Territory.

Population of the Krasnoyarsk territory is spread around water and main traffic arteries. The south of the region (10 % of the whole territory) has become home to 82 % of overall population and it concentrates the largest proportion of urban settlements. Moreover, one third of the territory population lives in the capital city of the region. Many big cities such as Kansk (94,000 people) and Achinsk (110,400 people) are situated close to the Trans-Siberian Railway. Submeridianal river Enisey lies close to other big cities such as Minusinsk (74,000 people) and Lesosibirsk (66,300). Though there is one exception that Norilsk is situated behind the Polar circle with its urban agglomeration of 176,000. Almost 94.5 % of rural population is concentrated south from Angara River which estimates 21.2 % of territory area.

During the last twenty years the population dynamics of the Krasnoyarsk territory was reducing. With its top value of 3,164.2 thousand people reached in 1992, by 2010 it declined by 337.7 thousand (almost 10.7 %). This decline is

caused by 54.7 % due to natural loss and by 45.3 % due to migration loss. First of all, depopulation is more significant in rural areas (population here declined by 22.7%) and northern districts (population here declined by 26 %).

Female population dominates in Krasnoyarsk Territory and stands for 53.4 % out of total population. Age structure of the population is similar to all-Russian. The relation of non-working population to working population is lower than the same indicator in the Siberian Federal District and the rest of Russia. However, since 2007 the territory has experienced an increase in non-working population.

Life expectancy (for people born in Krasnoyarsk Territory) is 1 year less than average in Russia. Though, the difference in life expectancy between urban population and rural population in Krasnoyarsk Territory is higher than Russian average (4, 3 and 2, 7 years accordingly) while the difference in life expectancy between men and women is slightly less (11.6 and 11.9 accordingly).

One of the core problems of low life expectancy is extra-high death rate, particularly within able-bodied men. Causes of death in Krasnoyarsk Territory are similar to all-Russian. However, we can distinguish that people here die more frequently due to the following reasons: accidental alcohol poisoning, suicide, infectious



Fig. 1. Krasnoyarsk Agglomeration

and parasitic diseases and car accidents. Ecology is also influential and causes more and more deaths of neoplasm.

Distinctions in standards of life between urban and rural population of able-bodied age in Krasnoyarsk Territory are more significant than the rest of Russia and Siberian Federal District which means greater and more considerable difference in quality and conditions of life.

Infant mortality in Krasnoyarsk Territory in comparison to Siberian Federal District (on average 1 ‰) and Russian mean value (on average 2.7 ‰) is rather high, despite the latest tendencies to decrease.

All in all, during the last two decades Krasnoyarsk Territory has earned a reputation of a region that provides other regions with population. Growth migration loss was spread up until 2006 but from 2007 up to 2011 it turned into migration growth supported by external migration. Meanwhile, the number of people

heading for other regions is still higher than the number of people entering Krasnoyarsk Territory. Also, international migration balance is increasing. Three forth of international migrants come from Baltic States and CIS. Thus, 66.3 % out of all people who arrived to Krasnoyarsk Territory came from Tajikistan, Azerbaijan, Armenia, Kazakhstan and Ukraine. On the other hand, 79.6 % of general number of people who left Krasnoyarsk Territory went to Ukraine, Germany, Kazakhstan, Belarus and Azerbaijan.

Krasnoyarsk Agglomeration is the core and chief area of Krasnoyarsk Territory (Fig. 1) which occupies a territory with highest density of population within Krasnoyarsk Territory borders: by 1st January 2012 Krasnoyarsk Agglomeration occupied 24.1 thousand square kilometers which stands for 1 % of the whole Krasnoyarsk Territory with a number of 1,185,697 people living there (41.8 % of all people living in Krasnoyarsk Territory and 50.5 % of urban population).

Krasnoyarsk agglomeration consists of:

- Urban districts – Krasnoyarsk, Sosnovoborsk and Divnogorsk.
- Regions – Berezovskij, Emelianovskij, Manskij and Sukhobuzimskij regions.

Krasnoyarsk is a central city of the Krasnoyarsk territory.

Memorandum about organization and implementation of municipal project “Comprehensive development of Krasnoyarsk Agglomeration until 2020 year” was signed on 17th April 2008 between municipalities stated above.

In this particular case, urban agglomeration is defined as space-saving spatial grouping of settlements (mainly urban settlements) combined in one agglomeration by means of intensive production, labour, cultural and recreational relations. From a monocentric and polycentric point of view, Krasnoyarsk Agglomeration composed of three cities and four non-urbanized municipalities is a monocentric agglomeration with a central city of Krasnoyarsk.

Fluctuations in number and placement of Krasnoyarsk Agglomeration population

During the period of 2000-2012, Krasnoyarsk Agglomeration resident population dynamics can be characterized by steady growth while the population of the Krasnoyarsk Territory was decreasing. During the last 12 years the population of the whole region has declined by 6.1 % while population of the Krasnoyarsk Agglomeration has risen by 8.4 % which means accordingly that concentration of the number of people living within the borders of agglomeration has increased in comparison to the amount of population living in the rest of Krasnoyarsk Territory (from 36.2% to 41.8%).

The main two sources of population growth within Krasnoyarsk agglomeration can

be distinguished which are cities Krasnoyarsk and Sosnovoborsk (these cities have the same growth rate of 110.7 %). At the same time, Berezovskij district did not show any changes in population size despite insignificant fluctuations; Emelianovskij District' population has increased by 2.5 %; Divnogorsk' population has declined by 5.5 %, as well as Sukhobuzimskij district' has declined 14.1 % and Manskij district' has declined by 17.7 %.

The percentage of urban population in agglomeration prevails over rural population and by 1st January 2012 about 92.4 % of agglomeration population came from urban areas.

On the whole, Krasnoyarsk Territory is characterized with low density of population (the average density is 1.2 persons per 1 sq. km) while by the year of 2011 Krasnoyarsk agglomeration' density was estimated to be 48.7 people per 1 sq. km which is actually insignificantly higher than the same indicator in 2000 (the density of population was 45.3 persons per 1 sq. km). Taking all municipalities into account, the most densely populated is the city of Krasnoyarsk and the less densely populated is Manskij District.

Factors that influence the size and composition of Krasnoyarsk Agglomeration population

Until 2008 a total increase of population in Krasnoyarsk Agglomeration was mainly supplied by the net migration which was compensating for natural loss of population (Fig. 2).

In years 2009-2010 natural increase of population was estimated to be 2.0 per mille. The problem of natural loss of resident population of Krasnoyarsk Agglomeration is less urgent than in comparison with the same problem in the rest of Krasnoyarsk territory. Natural increase of population in the city of Krasnoyarsk and Sosnovoborsk was having the greatest influence on the situation as a whole (particularly

Table 2. Density of population, 2011.

| Territory | Russian Federation | Siberian Federal District | Krasnoyarsk Territory | Krasnoyarsk Agglomeration | Krasnoyarsk City | Divnogorsk | Sosnovoborsk | Emel'yanovskij District | Berezovskij District | Manskij District | Sukhobuzimskij District |
|---|--------------------|---------------------------|-----------------------|---------------------------|------------------|------------|--------------|-------------------------|----------------------|------------------|-------------------------|
| Density of population, (people per 1 square km) | 8,4 | 3,7 | 1,2 | 48,7 | 2605,6 | 64,5 | 2257,3 | 8,9 | 6,3 | 2,7 | 3,6 |

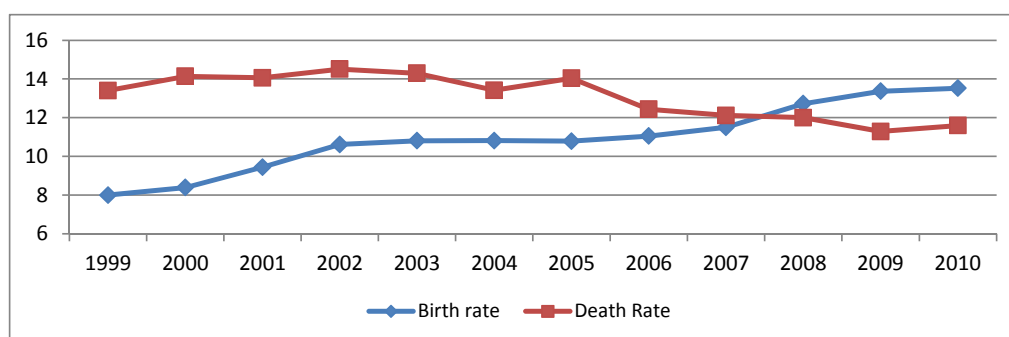


Fig. 2. Indicators of birth rate and death rate of resident population of Krasnoyarsk Agglomeration

these cities had positive natural increase of population). As for other municipalities of agglomeration, Divnogorsk had zero growth on 2010; while all municipal districts have natural loss during the period under review (Manskij and Sukhobuzimskij districts experience natural loss of 12-14 per mille).

Until 2008, net migration compensated for natural loss of population. Out of all municipalities being a part of Krasnoyarsk Agglomeration only the city of Krasnoyarsk can boast of having constant net migration (from 3.6 to 14.4 per mille annually) while other municipalities are less stable in net migration.

Age structure of population is influenced both by natural and migratory movement of Krasnoyarsk Agglomeration population, which has a substantial effect on the difference between age structure of population of the whole territory:

A Share of population of younger ages (not older than 15) in Krasnoyarsk Agglomeration is lower than the same indicator in the rest of the territory, which is resulted from a lower birth rate in urban municipalities of agglomeration in comparison with the rest of the region.

A Share of population of ages from 16 to 35 years old is higher in Krasnoyarsk agglomeration than the same indicator in the rest of territory. One of the main reasons for this is inflow of youths to study in universities and further employment. In years 2005-2010 a share of population of ages from 35 to 40 years old increased but this was mainly resulted from age shift (previous dominant age group became 5 years older and shifted to another category).

1. One of the most negative factors that can be distinguished is migration outflow of Krasnoyarsk Territory population aged around

30 years old which 5 years later led to decrease of shares of age groups from 30 to 35 years old and from 35 to 40 years old.

2. A Share of population aged from 50 to 65 years old in Krasnoyarsk Agglomeration in 2000 is higher than the same indicator in the rest of the territory the same year. This can be resulted from different reasons which demand an additional inspection: 1) One reason can be lower mortality rate of this age group in Krasnoyarsk Agglomeration; 2) inflow of people aged 50-65 years old in the city of Krasnoyarsk and satellite-cities in accordance with rapid development of industrial economy and construction industry in post-war period. In years 2005 and 2010 a shift in ages of this group is also observed.

According to the data on the volume and structure of migration flows in the Krasnoyarsk agglomeration the following conclusions can be drawn:

1. Migration is an essential factor of the Krasnoyarsk agglomeration resident population growth. During the analyzable period net migration is positive and the growth is begging from 2007. Despite the fact that the data stream contains information about arrivals and disposed departures between municipalities, in general, it establishes the fact of population growth due to migration.

2. Krasnoyarsk makes a considerable and increasing contribution to migration flow for whole Krasnoyarsk Territory. In 2000, there were 77.1 % arrivals to Krasnoyarsk and 74.2 % departures from, in 2011 - 83.2 and 72.3 accordingly. All other municipalities make no more than 7%.

3. Taking pattern of migration flow into account, it can be seen that migrants within the borders of the region prevail over migrants coming from other regions of Russia and parts of the world. In year 2000 almost 67.3 % of incoming migrants were inside the region and

63.7 % among migrants who left the region, by the year 2011 it was 59.9 % and 64 % accordingly.

4. The higher the percentage of urban population is, the higher the volume of flows from other regions of Russia and abroad. Thus, share of these migrants in the Krasnoyarsk in 2000 was 34.6 % of arrivals and 39.8% of departures, in 2011 - 43.2% and 42.5 %, accordingly. In 2000 in Sukhobuzimskij district a share of migrants from other regions of Russia and abroad was 21.1% of arrivals and 26.1% of departures, in 2011 - 19.2 % and 13.7 % accordingly.

Socio-economic development of Krasnoyarsk agglomeration will be executed against the background of demographic problems. The following long-term programs are directed amend the problems: "Improvement of a demographic situation in Krasnoyarsk Territory", 2010-2012; "Children", 2010-2012; "Krasnoyarsk Territory program of assistance to voluntary resettlement of the compatriots living abroad to the Russian Federation, for 2010-2012"; "North to South", 2011-2013; "Resettlement of people living in the urban district of the city of Norilsk and town Dudinka, in areas with favorable climatic conditions in the Russian Federation" for 2011-2020. etc.

The long-term demographic problems:

- Development of Krasnoyarsk agglomeration on the assumption of a prolonged depopulation of the country and the Krasnoyarsk Territory. Over the last 20 years, the population of Krasnoyarsk territory has significantly decreased, despite some positive tendencies since 2008. Demographics provides no basis for judging the possible importance of population growth without an active migration policy, under these conditions, the population of Krasnoyarsk agglomeration increases due

to 'contraction' of the population in the Krasnoyarsk agglomeration with 'baring' of the rest of the territory.

- Birth rate is low and it does not provide a simple reproduction of the resident population in the Krasnoyarsk Territory and especially in Krasnoyarsk agglomeration. In the Krasnoyarsk, Divnogorsk, Sosnovoborsk, where the generality of the agglomeration' population concentrates, total fertility rate is lower than in the whole Krasnoyarsk Territory. Accordingly, this dynamics inevitably leads to unavoidable reduction of resident population.
- Intensification of the aging of the population. In spite of low indicator of share of population over 60 years old, the population of Krasnoyarsk Territory and agglomeration is old and aging is proceeding.
- High death rate, especially within men at able-bodied age. This problem defines lower values of life expectancy at birth in Krasnoyarsk Territory in comparison with average value in Russian Federation. According to the dominance of urban

population, agglomeration death rate is lower than in Krasnoyarsk Territory and whole country.

Conclusion

There was steady growth in resident population size of Krasnoyarsk agglomeration in 2000-2012, against reduction of population of Krasnoyarsk Territory. It concerns the 'contraction' of the population in the Krasnoyarsk agglomeration with 'baring' of the rest of the territory. The main factor of agglomeration population growth is net migration which is especially typical for the agglomeration center that is Krasnoyarsk.

In spite of perpetual processes of aging, Krasnoyarsk agglomeration population is still younger in comparison with Krasnoyarsk Territory and whole country. An opportunity to get professional education in the city attracts young people; however, it is of utmost importance to develop standards of living and convince young generation not to leave the region. However, in order to maintain the current level of population on the assumption of low birth rate further development of measures to reduce mortality is of utmost necessity.

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Тенденции изменения численности и структуры населения Красноярской агломерации

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В статье представлены результаты анализа демографической ситуации в Красноярской агломерации на фоне Красноярского края и Российской Федерации, определены особенности изменения численности и структуры населения Красноярской агломерации и основные факторы, особое внимание уделено неравномерности расселения населения.

Ключевые слова: демографическая ситуация, плотность населения, рождаемость, смертность, миграция, демографические проблемы.

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